Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of adding a new connection (c, d) to a switch fabric, said fabric comprising a set I of k input elements, a set M of m switch elements, and a set O of l output elements, each one of said input elements contributing one input to each one of said m switch elements, each one of said output elements receiving one output from each one of said switch elements, and each one of said switch elements receiving one input from each one of said input elements and selectably switching said received inputs to one or more of said output elements, said switch fabric having a state S_m characterizing said m switch elements as a set of ordered pair connections (i, j) wherein:
   (i) i is an input of a ~~said~~ connection (i, j);
   (ii) j is an output of said connection (i, j);
   (iii) $(i, j) \in S_m$ if and only if a j^{th} one of said output elements is coupled to an i^{th} one of said input elements through one of said switch elements,
   (iv) said state S_m having a range range(S_m) wherein if $j \in$ range(S_m) then $(i, j) \in S_m$ for some $i \in I$;
   (v) said state S_m having a domain domain(S_m) wherein if $i \in$ domain(S_m) then $(i, j) \in S_m$ for some $j \in O$;

said method comprising:

(a) determining if said switch state S_m exists wherein $c \notin$ domain(S_m) and $d \notin$ range(S_m);
(b) if said switch state S_m exists wherein $c \notin$ domain(S_m) and $d \notin$ range(S_m), adding said new connection to S_m as (c, d);
(c) if said switch state S_m does not exist wherein $c \notin$ domain(S_m) and $d \notin$ range(S_m), determining if said switch state S_m exists wherein $c \notin$ domain(S_m);
(d) if said switch state S_m does not exist wherein $c \notin$ domain(S_m), terminating said method by indicating that c is fully allocated;
(e) if said switch state S_m exists wherein $c \notin$ domain(S_m), determining if a switch state S_n exists wherein $d \notin$ range(S_n);
(f) if said switch state S_n does not exist wherein $d \notin$ range(S_n), terminating said method by indicating that d is fully allocated;
(g) if said switch state S_n exists, joining said switch state S_m and said switch state S_n to form a union J by:
   (i) allocating a label u to each element (i', j') in J if $(i', j') \in S_m$;

(ii) allocating a label v to each element (i', j') in J if $(i', j') \in S_n$; and,

(iii) adding said new connection (c, d) to J.

2. (original) A method as defined in claim 1, further comprising:
   (a) after adding said new connection (c, d) to J, allocating said label u to said new connection (c, d);
   (b) determining if there exists a connection $(i', d) \in$ J wherein said label u has previously been allocated to said connection $(i', d) \in$ J;
   (c) if there does not exist a connection $(i', d) \in$ J wherein said label u has previously been allocated to said connection $(i', d) \in$ J, terminating said method;
   (d) if there exists a connection $(i', d) \in$ J wherein said label u has previously been allocated to said connection $(i', d) \in$ J, reallocating said label v to said connection $(i', d) \in$ J;
   (e) determining if there exists a connection $(i', j') \in$ J wherein said label v has previously been allocated to said connection $(i', j') \in$ J;
   (f) if there does not exist a connection $(i', j') \in$ J wherein said label v has previously been allocated to said connection $(i', j') \in$ J, terminating said method;
   (g) if there exists a connection $(i', j') \in$ J wherein said label v has previously been allocated to said connection $(i', j') \in$ J, reallocating said label u to said connection $(i', j') \in$ J;
   (h) setting $d = j'$;
   (i) repeating said method commencing at claim 2(b).

3. (currently amended) A method as defined in claim 1, further comprising:
   (a) after adding said new connection (c, d) to J, allocating said label v to said new connection (c, d);
   (b) determining if there exists a connection $(c, j') \in$ J wherein said label v has previously been allocated to said connection $(c, j') \in$ J;
   (c) if there does not exist a connection $(c, j') \in$ J wherein said label v has previously been allocated to said connection $(c, j') \in$ J, terminating said method;
   (d) if there exists a connection $(c, j') \in$ J wherein said label v has previously been allocated to said connection $(c, j') \in$ J, allocating said label $\underline{u}$ **m** to said connection $(c, j') \in$ J;
   (e) determining if there exists a connection $(i', j') \in$ J wherein said label u has previously been allocated to said connection $(i', j') \in$ J;
   (f) if there does not exist a connection $(i', j') \in$ J wherein said label u has previously been allocated to said connection $(i', j') \in$ J, terminating said method;

(g) if there exists a connection $(i', j') \in J$ wherein said label u has previously been allocated to said connection $(i', j') \in J$, allocating said label v to said connection $(i', j') \in J$;
(h) setting $c = i'$; and,
(i) repeating said method commencing at claim 3(b).

4. (currently amended) A method as defined in claim 2, further comprising, before allocating said label u to said new connection added to J:
(a) determining the number X of connections requiring reallocation of labels if said label u is allocated to said new connection added to J;
(b) determining the number Y of connections requiring reallocation of labels if said label v is allocated to said new connection added to J;
(c) if $X \leq Y$, continuing said method commencing at claim 2(a); and,
(d) if $X > Y$, continuing said method commencing at claim 3(a).

5. (currently amended) A method as defined in claim 3, further comprising, before allocating said label v to said new connection added to J:
(a) determining the number X of connections requiring reallocation of labels if said label u is allocated to said new connection added to J;
(b) determining the number Y of connections requiring reallocation of labels if said label v is allocated to said new connection added to J;
(c) if $Y \leq X$, continuing said method commencing at claim 3(a); and,
(d) if $Y > X$, continuing said method commencing at claim 2(a).

6. (original) A method as defined in claim 1, further comprising, before claim 1(a):
(a) defining a multicast group comprising a first plurality of said input elements and said output elements, each of said input elements and said output elements having a second plurality of time slots;
(b) for each one of said time slots, forming a union of all connection requests received in respect of each of said input elements and said output elements;
(c) representing said multicast group as a single pair of said input elements and said output elements;
(d) associating said union with said multicast group;
(e) performing said claim 2 method commencing at claim 2(a); and,
(f) for each one of said time slots, translating connection requests applied to said multicast group to equivalent connection requests applied to each one of said first plurality of said input elements and said output elements.